



THE POSITIVE IMPACT OF NEGATIVE FEEDBACK
THESIS

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AFIT/GRD/ENV/11-M03

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Abstract

While feedback is an essential element of performance, there is little theory explaining the effects of negative feedback. Disagreement exists as to whether negative feedback is good or bad and this impacts its use. Fortunately, control theory provides scholars with an opportunity to better understand negative feedback and the conditions necessary to support its intended function. This study examined the relationship between negative feedback and task performance in a leadership development environment. This work asserts that performance is contingent on perceived feedback usefulness, such that the relationship is stronger when feedback usefulness is high and weaker when it is low. In addition, this research led to the creation of a new instrument to measure perceptions of feedback usefulness as an antecedent of effective feedback.

Results indicate positive effects of negative feedback on performance, with moderating effects of feedback usefulness on four post-feedback tasks. Analysis also demonstrated that the newly developed feedback usefulness scale demonstrates good model fit (evaluated by confirmatory factor analysis) and strong internal consistency reliability (Cronbach's α).

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Mark B. Richey

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THE POSITIVE IMPACT OF NEGATIVE FEEDBACK

I. Introduction

A considerable body of evidence suggests that feedback is essential for increasing performance. However, researchers have not defined a comprehensive model to explain feedback's effect on performance, particularly in the area of negative feedback, and this creates gaps that may cause raters to (unknowingly) deliver sub-optimal performance feedback. Hence, additional study of feedback is necessary to enhance practical understanding of feedback methods and their application.

Although the literature suggests both positive and negative feedback can affect performance, a gap in understanding negative feedback presents great opportunity for research. Researchers can move toward a better understanding of negative feedback by investigating feedback methodology. The control theory of motivation is also important to this effort because it provides a mechanism to explain how negative feedback affects human performance.

Perhaps because little consensus exists as to whether negative feedback is good or bad, scholars and practitioners often miscalculate the conditions necessary for feedback to function as intended. If research determines whether negative feedback is an effective tool, it will significantly alter both theoretical and practical approaches to understanding and applying feedback. This manuscript will provide an opportunity to enhance

understanding of negative feedback's effect on performance, and the antecedents of effective feedback.

In order to achieve a better understanding of negative feedback, this effort will use multi-source feedback. Also referred to as 360-degree feedback, early studies demonstrated that multi-rater feedback methods have positive effects on performance. Results of one such study demonstrated that the agreement between one's self-perception of performance and others' perceptions is associated with better performance evaluations, promotion rates, and other measures of career success (Bass & Yammarino, 1991).

Despite these early findings, the literature suggests a lack of depth in theoretical and practical understanding of negative 360-degree feedback's effects. As organizations gained experience with the 360-degree feedback method, conflicting results strengthened this concern. Subsequently, scholars identified the abundance of leadership development programs as fertile ground for researching the value of negative feedback through 360-degree feedback methodology.

Moving toward an evaluation of negative feedback in a leadership development environment, it is also important to leverage sound leadership theory for accurate measures of leadership behavior. Accordingly, this effort will employ a leadership behavior survey based on Bass' (1985) full range of leadership model, which is a well-respected contemporary leadership theory. Additionally, this research will employ survey items measuring participants' perceptions of 360-degree feedback as antecedents of effective feedback, before analyzing the effects of negative feedback on post-feedback performance measurements.

Implications

This thesis holds potential implications for both theory and practice. It enhances academic understanding of negative feedback's impact on a recipient's performance. This research also provides organizations with new insight on the value of negative feedback in shaping individual performance. In addition, this study contributes to the body of knowledge on the efficacy of multi-rater feedback methods. Finally, these implications are important because they influence feedback orientation culture across both the theoretical and practical communities.

II. Literature Review

Available literature indicates agreement on the definition of feedback, which emanates either from others positioned to evaluate an individual's behavior or from within the individual (Ilgen, Fisher & Taylor, 1979). However, scholars disagree on aspects such as the usefulness of negative feedback, which ultimately leads to the conclusion that additional research must be accomplished to understand the effects of feedback interventions (Mitchell & Daniels, 2003). The following review provides a foundation to better understand the effects of negative feedback on performance.

Feedback

Feedback is important because it provides information about the effectiveness of an individual's behavior, which is essential for learning and motivation (Ilgen et al., 1979). Kunich and Lester (1996) describe feedback as an art necessary for effective leadership, while Borman (1997) simplifies this concept by suggesting that people must first gain insight about their weaknesses in order to improve performance. Although researchers and practitioners generally understand these interpretations of feedback, their foremost question is often whether feedback really works.

360-degree Feedback

In order to study feedback's effects on performance, this effort will focus on the 360-degree feedback method, which uses feedback vectored from four sources: downward from the recipient's supervisor, upward from subordinates, laterally from peers or coworkers, and inwardly from the recipient (Waldman, Atwater & Antonioni, 1998).

360-degree feedback reports typically include a complete list of ratings provided by the other sources, as well the recipient's own self-ratings. The reports may also summarize differences or "discrepancies" between others' and self-ratings.

The 360-degree feedback method is interesting to both researchers and practitioners because of its widespread influence. By the late 1990s, 360-degree feedback programs were very popular amongst corporate leaders to the point where its use was nearly universal among Fortune 500 companies (Ghorpade, 2000). Upon investigation of this phenomenon, Waldman, Atwater, and Antonioni (1998) suggested that organizational leaders believed the addition of others' ratings to feedback intervention prompted effective behavioral change in management. However, this thought was not well supported by research.

As far back as 1979, Ilgen et al. studied individual behavior in organizations and concluded that feedback is necessary for effective role performance. Likewise, initial research on 360-degree feedback suggested that comparisons of self and subordinate ratings can influence performance outcomes because many leadership behaviors are observed only by the leader and subordinate (Atwater, Roush, & Fischthal, 1995). These initial findings led Borman (1997) to recommend additional research focused on determining 360-degree feedback's ability to improve individual and organizational effectiveness. Unfortunately, this area of study remains a challenge as organizations continue to struggle with their rationale for implementing 360-degree feedback programs (Waldman, Atwater, & Antonioni, 1998).

Negative Feedback

One way to examine this problem is by taking a closer look at negative feedback.

With respect to 360-degree feedback, others' ratings that are lower than the recipient's self-ratings are considered negative feedback. In order to demonstrate its potential affect on task performance, the following paragraphs will touch on several studies summarizing findings about negative feedback.

Initially, negative feedback appears to have a positive effect on performance.

Ashford (1989) concluded that leaders receiving low follower ratings will likely view them as discrepant with their self-perception and become motivated to improve performance to rectify the discrepancy. Kaplan (1990) followed suit with his assertion that others' negative evaluations, relative to self-evaluations, are motivational. London and Smither (1995) argued that discrepancies between others' and self-ratings play an important role in 360-degree feedback programs. Their model suggests discrepancies between others' and self-ratings drive feedback recipients to perform gap analysis and attempt to close the gap (e.g., if self-ratings exceed those of others, recipients improve their performance).

Recent studies also support the use of negative feedback. For example, Smither, London, and Reilly (2005) indicated that simply receiving unfavorable ratings might increase the recipient's perception that they need to improve their performance. Additionally, Nowack (2009) identified where managers who received a small amount of unfavorable feedback actually improved their performance. These findings suggest that negative feedback is useful under certain conditions, which is an intriguing proposition during an era when raters often avoid negative feedback altogether.

However, the literature also indicates that negative feedback may be detrimental to performance. Researchers have suggested that it induces frustration (Podsakoff & Farh, 1989), de-motivation (Kluger & DeNisi, 1996), and discouragement among recipients (Atwater & Brett, 2005; Brett & Atwater, 2001). Becker and Klimoski (1989) analyzed performance data from the field and noted negative feedback was related to lower performance. Additional work characterizes negative feedback as less accurate, less useful, and related to negative reactions such as feeling angry, judged, confused, criticized, or discouraged (Brett & Atwater, 2001). At this point, it seems possible that moderating factors might influence negative feedback's effect on performance.

Clearly, the preceding summaries indicate a lack of agreement on the effects of negative feedback. To investigate this discrepancy, Fleenor worked on two separate studies examining the relationship between negative 360-degree feedback and managerial effectiveness. He first studied 2,056 managers enrolled in leadership development programs (Fleenor, McCauley, & Brutus, 1996). Two years later, he conducted additional research on 1,460 leadership development students that were not part of the 1996 study (Atwater, Ostroff, Yammarino, & Fleenor, 1998). Subjects in these studies represented a range of public and private organizations including educational, manufacturing, transportation, human services, government, and financial organizations. They completed multi-rater survey assessments, which emphasized items on their abilities such as "leading people, managing job challenges, starting a project from scratch, negotiating a major contract, taking on additional responsibilities."

Initially, the two studies suggest similar findings. For example, Fleenor et al. (1996) found that others-self ratings discrepancies may play a motivational role in

leadership development, and Atwater et al. (1998) asserted that others-self agreement may be important for some performance outcomes. Beyond this similarity, the results of Fleenor et al. (1996) and Atwater et al. (1998) begin to diverge. Among these discrepancies, Fleenor et al. (1996) concluded that self over-raters are no less effective than self under-raters, but Atwater et al. (1998) concluded that managerial effectiveness tends to increase for self under-raters and decrease for self over-raters. Additionally, while Fleenor et al. (1996) determined that others' ratings alone may be sufficient in predicting managerial effectiveness, Atwater et al. (1998) argue that simultaneous consideration of self-ratings and other-ratings is necessary to gauge managerial effectiveness. Finally, Atwater et al. (1998) suggests additional research is needed with different types of outcome measures, because available studies have relied on surveys to capture supervisors' subjective measures of performance.

Considering the diverging results of Fleenor's work, the use of objective outcome measures might benefit future research on the effects of negative feedback. Also notable is that only 50% of 360-degree feedback recipients achieved performance improvements (Atwater, Waldman & Brett, 2002). These findings highlight disagreement throughout feedback literature, which calls for a closer examination of negative feedback's motivational effect.

Control Theory

Of the various approaches to understanding motivation, control theory stands out because of its emphasis on the effects of negative feedback. Carver and Scheier (1998) based control theory on their understanding of negative feedback loops, which are

mechanisms by which systems sense a condition, determine what the condition means, then generate an action in response to the condition. As depicted in Figure 1, negative feedback loops consist of four elements: an input function (sensor), reference value (standard), comparator (structure that makes comparisons), and output function (action).

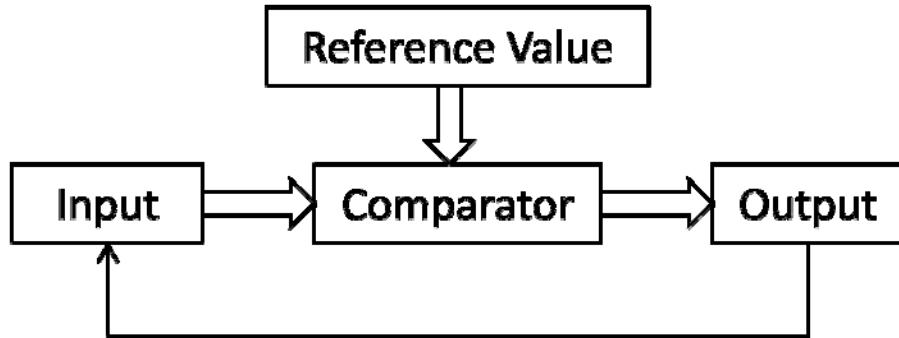


Figure 1. Control Theory Negative Feedback Loop (Carver & Scheier, 1998)

To better understand the negative feedback loop, it is best to think in terms of a recipient's internalization of feedback. First, the recipient's perception of feedback acts as an input function. For example, when a supervisor states "your performance on task x is below expectations," the subordinate will likely perceive this as negative feedback. Next, a recipient's cognition performs the role of comparator by judging the feedback against an existing preference or goal, which equates to a reference value. In other words, once a person perceives feedback as negative, they will subsequently access a reference value representing their own expectation of performance on the task. If this reference value represents a higher standard of performance, the comparator will then determine a need for behavioral change. Finally, the recipient's subsequent action serves as an output function because it affects follow-on task performance.

Negative feedback loops create a self-regulatory cycle that is analogous to the temperature control provided by a thermostat's programmed function. For example, in the wintertime, a properly functioning thermostat will initiate furnace heat when temperatures are lower than the reference standard. Control theorists assert the human mind operates similarly when processing negative feedback.

In a similar way, negative feedback loops also explain an individual's self-regulation of behavior. Specifically, it suggests that when discrepancies exist between one's current state and goal (i.e. reference value), individuals want to resolve those discrepancies by eliminating undesired conditions (Taylor, 1991) and moving closer to the goal (Carver & Scheier, 1990). Feedback is important because it provides an individual with a measure of their current state in relation to their goals. For example, if a manager receives feedback indicating they display poor leadership, they will subsequently increase relevant behaviors if their goal is to be a good leader.

Carver and Scheier (1998) assert that *how* comparisons occur is not as important as *whether* comparisons occur. Once a comparison happens, resulting behavior changes are dependent on discrimination between input and reference values (Carver & Scheier, 1990). If the comparison reveals a difference, the output (behavior) changes (Carver & Scheier, 1998). If a difference is not recognized, the feedback recipients forego behavioral adjustment. Hence, the comparator element is what enables the self-regulatory mechanism (Carver & Scheier, 1998).

Beyond the comparator's self-regulatory effect, Diefendorff and Gosserand (2003) highlight another central tenet of control theory, which is that goals (reference values) are hierarchically arranged. Specifically, long-term goals are regulated by

feedback loops higher on the pyramid compared to feedback loops controlling short-term behavioral goals. For example, managers enter leadership development programs with the overarching goal to improve their leadership ability. This goal subsequently influences the leader's reference values for task performance throughout the course. Hence, no matter the stated goal for a specific task, feedback is also compared to reference values shaped by hierarchical goals. The preceding scenario is important because it demonstrates how goals at different levels are interrelated such that they influence the negative feedback loop's output (Diefendorff & Gosserand, 2003). Further, this relationship provides rationale for action in the absence of stated goals.

Control theory suggests that feedback and goals are integrated, inseparable elements of the motivational process (Klein, 1989). However, goal-setting theorists disagree with control theorists over the nature of human motivation (Mitchell & Daniels, 2003). Specifically, control theorists believe humans seek to reduce feedback-loop discrepancies, but goal-setting theorists suggest people are actively involved in setting specific goals that create discrepancies (Mitchell & Daniels, 2003). Interestingly, the goal-setting perspective does not explain how people are motivated to perform novel tasks. In some cases, goals are provided to motivate task performance. However, in the absence of provided goals, people cannot always define specific, measurable goals for tasks they have never performed. This issue raises the question of whether goals are necessary to influence performance on novel tasks. Research by Mitchell, Hopper, Daniels, George-Falvy, and James (1994) supports this possibility, by indicating that goal setting is less effective with novel tasks.

Consider a scenario where a new salesperson has been directed to “satisfy the customer.” This “goal” does not necessarily equate to a known reference value, because the salesperson has not previously accomplished this task. Additionally, the salesperson may have a different perception than the manager of what it takes to satisfy a customer. How would the salesperson determine how to act on this novel task? In this case, the person may revert to a previous experience within their feedback loop hierarchy in search of reference values that relate to vague goals such as “satisfy the customer.” If this happens, feedback would then undergo the comparator process against the most equivalent reference value.

Considering the aforementioned scenario, maybe goals are not absolute prerequisites for performance motivation as goal-setting theorists suggest. Hence, it seems as though goal-setting theory does not fully explain the relationship between negative feedback and performance on novel tasks. Therefore, in this situation, control theory appears preferential to goal-setting theory because negative feedback loop hierarchies can motivate performance through overarching goals and pre-existing reference values.

Feedback Moderation

As Ilgen and Davis (2000) stated, negative feedback is a necessary condition for behavioral change, but it cannot do so alone. For example, Ilgen et al. (1979) reported that recipients must also accurately perceive feedback for it to affect performance as intended, but negative feedback is frequently misperceived. Ultimately, it may be

difficult to accept even the fairest criticism when a recipient believes they have performed to the best of their abilities.

Personal experience influences feedback perception to the point that individual feelings about feedback processes will influence the likelihood of behavioral change following feedback (Atwater, Waldman & Brett, 2002). Such experiences can also cause feedback recipients to believe certain ratings sources are able to offer feedback considered more useful than others (Farr & Newman, 2001). These beliefs have led to the creation of effectiveness criteria measures for multi-rater feedback intervention programs (i.e., whether ratings sources believe the process is valuable) (Waldman, Atwater & Antonioni, 1998). Such effectiveness measures are useful in both experimental and practical environments, as they provide a means for organizations to tailor communications about 360-degree programs in an attempt to manage participants' expectations.

A recipient's ability to recall feedback also presents an interesting discussion. Smither, Brett and Atwater, (2008) determined that feedback recipients are more likely to recall feedback about specific behaviors than broad traits. Hence, some researchers have tailored survey items to focus on specific behaviors in an attempt to achieve greater effect.

Gosling, John, Craik, and Robins (1998) suggested that people refute negative feedback about themselves, specifically in areas that matter most to them. Day (2000) synthesized the literature on leadership development, concluding that managers must first be willing to accept feedback as relevant in order for feedback interventions to be effective. These findings prompted Brett and Atwater (2001) to research perceptions of

usefulness in 360-degree feedback programs. The following paragraphs summarize their work.

Similar to Fleenor's method, Brett and Atwater (2001) administered 360-degree surveys to 125 MBA students to assess leadership behaviors. Upon completion of the program, students completed questionnaires to assess their attitudes and reactions toward the feedback. This post-course survey included items such as "the feedback report was useful to me" and "the feedback report is valuable in helping me to diagnose my management abilities."

Brett and Atwater (2001) reached several conclusions. One is that self over-raters tended to discount feedback, perceiving it as less accurate. Next, they indicated that negative feedback evoked negative reactions such as anger, confusion, and discouragement; therefore, recipients viewed it as less useful (Brett & Atwater, 2001). Brett and Atwater (2001) also suggested that recipients of negative feedback were less development-focused than those receiving positive feedback. Brett and Atwater (2001) finally concluded that self over-raters reported significantly more negative reactions to the 360-degree feedback process itself. All of these findings combine to suggest negative perceptions of feedback can reduce its effectiveness (Brett & Atwater, 2001).

In 2005, Atwater and Brett again collaborated to measure and analyze recipients' reactions to developmental 360-degree feedback. In this second study, they discovered that self over-raters were more motivated to improve performance than in-agreement self-raters, contradicting the 2001 study, which concluded that self over-raters are less motivated to perform (Atwater & Brett, 2005). These conclusions follow a trend in conflicting research on negative 360-degree feedback ratings. Hence, this effort will also

consider potential items to measure feedback antecedents while formulating a new approach to understanding negative feedback.

Full Range of Leadership Approach

The full range of leadership model (FRLM), depicted in Figure 2, is one of the most widely studied leadership theories since the mid-1980s (Northouse, 2007). This approach is important because it provides a framework for categorizing leadership behaviors into meaningful feedback. Bass (1985) synthesized the FRLM through a recombination of Burns (1978) presentation of transactional and transformational styles as distinct ends of a leadership behavior continuum. Bass's (1985) approach leverages the complementary nature of each style and further delineates their dimensions. Transformational factors of the FRLM include idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration; while the transactional factors are contingent reward, management-by-exception, and laissez-faire.

Bass and Riggio (2006) provide the following descriptions of the four factors of transformational leadership. Idealized influence is a leader's ability to foster trust among followers, encompassing charisma, which is considered a leader's ability to impart their sense of vision, morals, and ethics on followers. Strong role models are able to exert idealized influence. Intellectual stimulation captures a leader's ability to invoke emotional appeals, lofty expectations, and confidence in followers for the purpose of goal attainment. If a leader possesses strong intellectual stimulation abilities, they can help followers engage in problem solving as well as creative and innovative thinking. Strong transformational leaders are known to tactfully question followers' beliefs, values, and

assumptions in order to break free of the status quo. Lastly, individualized consideration is known as the ability to develop and empower followers. Coaching and mentoring are great examples of this behavior. Such a leader is reputed to really care about their people. Northouse's (2007) book on leadership identifies communication skills as a common thread among transformational dimensions of the FRLM.

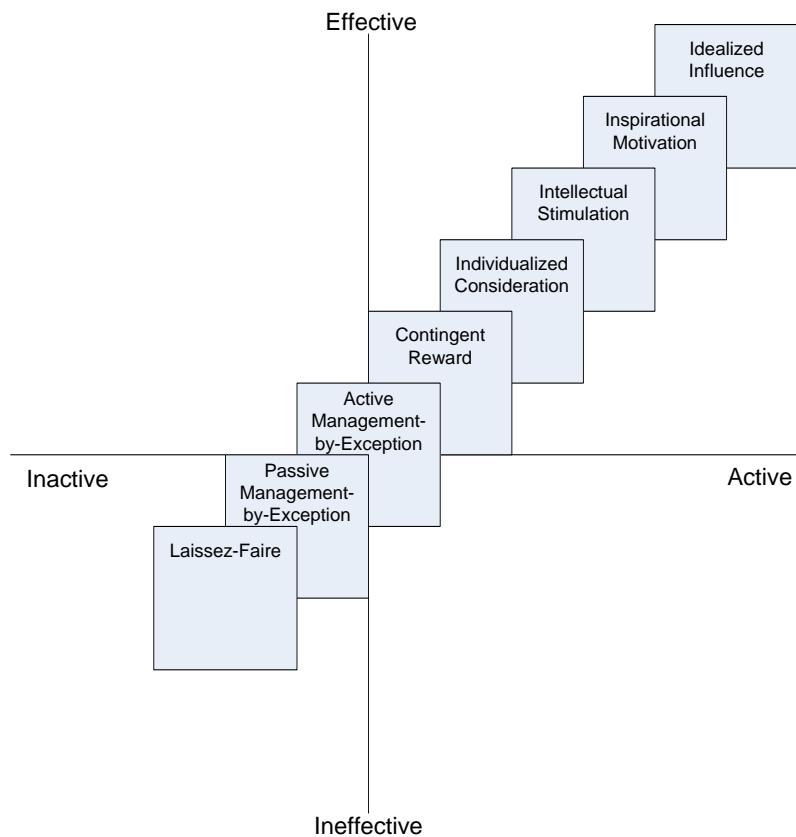


Figure 2. The Full Range of Leadership Model (Bass & Riggio, 2006)

The following descriptions cover transactional leadership, as defined by Bass and Riggio (2006). Contingent reward is the exchange of rewards for performance, while management-by-exception is characterized by a leader's tendency to either correct

deficiencies on-the-spot or intervene only after trends indicate poor performance. Laissez-faire behavior exemplifies an absence of leadership, where leaders shirk responsibilities by being unresponsive or failing to act. Transactional leadership is based on cognitive thought process and is often associated with objective evaluations and decisions.

Since gaining popularity throughout the late 1980s and 1990s, the FRLM has become a mainstay in leadership development programs across the globe. In fact, these programs often leverage 360-degree feedback methods incorporating leadership behavior surveys based on the FRLM, due to its high regard across academia. Hence, future research should consider use of similar instruments.

Hypotheses

The literature review examined 360-degree feedback intervention on subjects enrolled in leadership development programs and revealed disagreement about the motivational effects of negative feedback. While leadership development environments provide suitable opportunities for follow-on research, previous methods may not be appropriate. Notably, researchers have analyzed 360-degree feedback about leadership behavior against surveys of job effectiveness, rather than bottom-line task performance (Atwater, Waldman, & Brett, 2002). Hence, unlike previous efforts, this thesis proposes that measuring *post-feedback* performance in a leadership development environment will better determine the effects of negative feedback.

This work also proposes that effective feedback instruments should measure behaviors associated with specific types of tasks. For instance, behaviors relative to

transformational leadership rely heavily on a leader's communication skills. Therefore, negative transformational feedback is likely to influence the recipient's performance on communication-intensive tasks. Additionally, transactional leadership behaviors are known to heavily engage a leader's cognitive skills. Hence, negative transactional feedback is likely to influence the recipient's performance on cognitive tasks. Therefore, in order to determine accurate relationships between transformational and transactional feedback and performance, this thesis will employ both communication and cognitive tasks.

Control theory is helpful toward a better understanding of this problem because it suggests that negative feedback can motivate performance, even in the absence of specific goals. Furthermore, control theory provides an explanation of a student's performance on novel tasks. This is particularly helpful in a leadership development environment, where many tasks are brand new to the student.

Finally, this work will consider feedback recipients' perception of feedback usefulness as a moderator of task performance. Although previous studies generally report unfavorable reactions to negative feedback, ratings delivered in a leadership development environment are less threatening to a recipient's career than those received on the job. Hence, students should be more receptive to negative ratings, and this will motivate performance increases. The following hypotheses, modeled in Figures 3 and 4, were designed to advance the body of knowledge on the effects negative feedback.

H_1 : The relationship between negative transformational feedback and performance of (novel) communication tasks in a leadership development environment is

contingent on perceived feedback usefulness, such that the relationship is stronger when feedback usefulness is high and weaker when it is low.

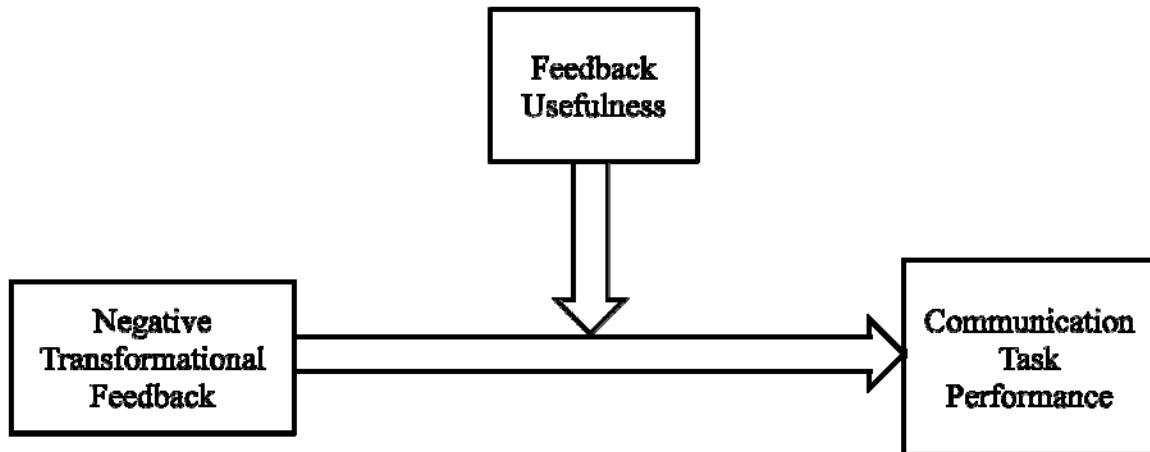


Figure 3. Proposed H₁ Model

H₂: The relationship between negative transactional feedback and performance of (novel) cognitive tasks in a leadership development environment is contingent on perceived feedback usefulness, such that the relationship is stronger when feedback usefulness is high and weaker when it is low.

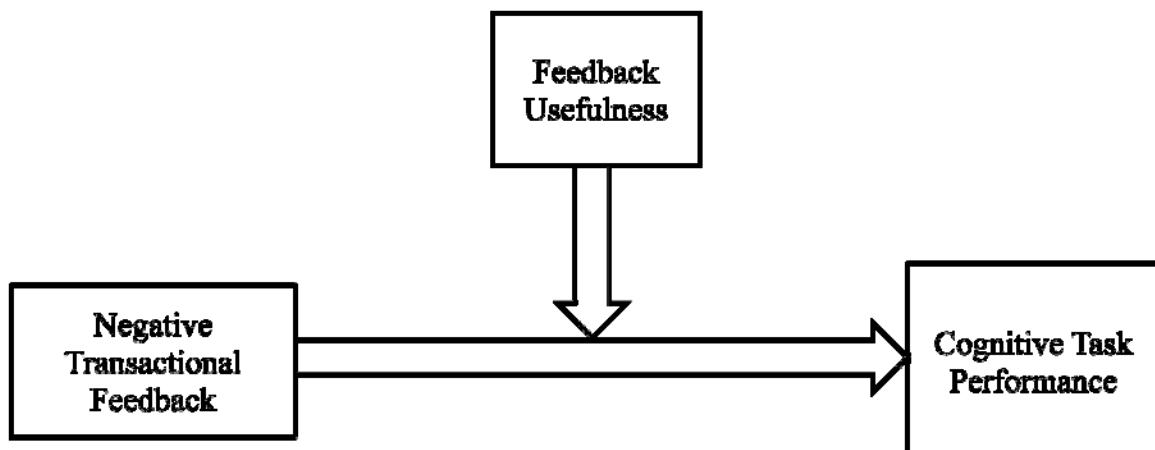


Figure 4. Proposed H₂ Model

III. Methodology

Participants

Three hundred sixty-four people participated in this study while attending a five-week leadership development course called Squadron Officer School, with approximately 89 percent categorized as Air Force officers with four to seven years of service experience. The remainder of the sample included government civil service employees, members of the Air Force Reserve, and members of the Air National Guard. Eighty-three percent of participants were male, and the sample had a mean age of 31 years. Sixty-two percent of the sample held Bachelor's degrees, 36 percent had earned a Master's, and the remaining two percent had doctorate degrees. Additionally, the sample was representative of a broad range of job specialties, from pilots and logisticians, to lawyers and acquisition professionals.

Procedure

Ten days prior to their arrival at Squadron Officer School, students received a web-based 360-degree feedback survey. Once students completed the surveys, identical surveys were distributed to supervisors, two peers, and two subordinates of each student. The timing was intended to gain maximum participation by supervisors, subordinates, and peers prior to course start. Following the FRLM lesson on day five, students received individual feedback reports based on the surveys. The 360-degree feedback reports contained ratings from all 364 students, 161 supervisors, 97 peers, and 70 subordinates. The course instructor explained 360-degree feedback reports (Appendix A)

to the class and remained available to answer students' specific questions. Participants then navigated the remainder of the course and received performance ratings on several tasks. Finally, every student completed an exit survey to measure feelings and attitudes about the course.

Measures

Method biases are a primary source of measurement error, threatening the validity of conclusions drawn from relationships between different measures (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). In order to minimize the potential for common method bias, Podsakoff et al. (2003) recommend that predictor and criterion variables be obtained from different sources. Hence, in this study, qualitative data was collected from three different sources: the students themselves, others (supervisors, peers, and subordinates), and trained evaluators.

Negative Feedback

Negative Feedback was measured using a 360-degree feedback survey that included 23 items from the Leadership Profile Measure. In the survey, students were asked to evaluate their own leadership behavior while supervisors, subordinates, and peers were also asked to assess each student's behavior according to the FRLM (described in Chapter 2). All leadership behavior items were measured using a five-point Likert scale where 1 represented *not at all* and 5 represented *frequently, if not always*. Self-ratings were then subtracted from composite others' ratings (the mean of supervisor, subordinate, and peer ratings). Resulting negative values represented negative feedback, and were obtained across the transformational and transactional dimensions. Below are

example items for every FRLM dimension measured by the survey, and a complete list of these items can be found in Appendix B.

Transformational Feedback

Idealized Influence (4 items).

- “I provide a good model for my team to follow.”

Inspirational Motivation (4 items).

- “I say positive things about the team.”

Intellectual Stimulation (4 items).

- “I ask questions that prompt others to think.”

Individual Consideration (4 items).

- “I support and encourage others' development.”

Transactional Feedback

Contingent Reward (4 items).

- “I personally compliment others when they do outstanding work.”

Management-by-Exception (3 items).

- “I focus others on problems when they don't meet standards.”

Performance

Trained evaluators rated students' performance throughout the five-week program. The evaluators, senior in rank to students by four to seven years, were qualified through a 14-week training program, and comprised a representative cross-section of the Air Force population. The selected performance tasks were categorized as either communication tasks or cognitive tasks.

The tasks were also considered novel because the students had not previously performed the exercises as part of their normal job activities outside of the leadership development course. Although students may have had similar experiences throughout their career, these exercises were unique because they involved explicit instructions and time limits. Each student's performance was measured on a grade (interval) scale ranging from zero to 4.0 for each task, whose descriptions are provided below.

Communication Tasks:

Job Briefing: Students demonstrated their oral communication and presentation skills by delivering a briefing about on their individual Air Force careers.

Project X. A leadership laboratory where students applied their leadership skills by directing teams to overcome a series of complex challenges. (two separate measurements were taken)

Cognitive Tasks:

Performance Appraisal Exercise: Students condensed important information from lengthy narratives into short snippets reflecting a pseudo-subordinate's job performance.

Team Leadership Problem: A leadership laboratory where students applied their teambuilding and problem solving skills, as they worked with classmates to achieve common goals. (three separate measurements were taken)

Feedback Usefulness

Perceptions of 360-degree feedback usefulness were measured by eight self-rated items at the end of the course. Following Hinkin's (1995) guidance on deductive scale development, the items were generated through careful consideration of work by

Waldman, Atwater, and Antonioni (1998); Gosling, John, Craik, and Robins (1998); Day (2000); Brett and Atwater (2001); Farr and Newman (2001); Atwater, Waldman, and Brett (2002); and Smither, Brett, and Atwater (2008), as discussed in Chapter 2. A deductive approach is important because it ensures that new items are logically derived from established theory (Hinkin, 1995). All items were measured using a five-point Likert scale where 1 represented *strongly disagree* and 5 represented *strongly agree*.

Below are example items, and a complete list of these items can be found in Appendix C.

“I can use 360-degree feedback to set goals for improving my leadership ability.”

“360-degree feedback could enhance the USAF’s performance feedback system.”

“One month after receiving 360-degree feedback, I remain aware of the ratings.”

The feedback usefulness scale had a 3.49 mean and .78 standard deviation.

Exploratory factor analysis was accomplished on the feedback usefulness data, and principal component analysis determined that no rotation was necessary because the items loaded onto a single factor. Four items with the highest factor loadings were retained for additional analysis. This reduction allowed for testing of item homogeneity, while ensuring parsimony (consistent with Hinkin, 1998).

Confirmatory factor analysis with maximum likelihood estimation was conducted using the Analysis of Moment Structures (AMOS) software package, with the model in Figure 5 depicting factor loadings for each item. A Cronbach’s α value of .74 provided an estimate of the internal consistency reliability of the scale (consistent with Field, 2009), meeting the minimum reliability of .70 required for newly-developed instruments (Nunnally, 1978). The following paragraph summarizes several interpretable goodness-of-fit statistics.

Representing the discrepancy between the unrestricted sample covariance matrix and the restricted covariance matrix, chi-square (χ^2) also reflects overall model fit to the data (Byrne, 2010). While small values are desirable for verifying fit, χ^2 and χ^2 ratios are affected by large sample sizes (Bentler & Bonett, 1980). Subsequently, Bentler (1990) proposed the comparative fit index (CFI), which compares the model fit to that of a null model while accounting for sample size; and values of at least .95 are desired. In addition, the goodness-of-fit index (GFI) compares the fit of the model with that of no model at all, and should exceed .90 to be accepted (Byrne, 2010). Finally, this analysis captured root mean squared error of approximation (RMSEA), where values of at least .10 or less are desirable (Browne & Cudeck, 1993). The four-item feedback usefulness factor reflects the following statistics: χ^2 (2, N = 364) = 6.77, p = .034 (ratio = 3.38, CFI = .99, GFI = .99, RMSEA = .08).

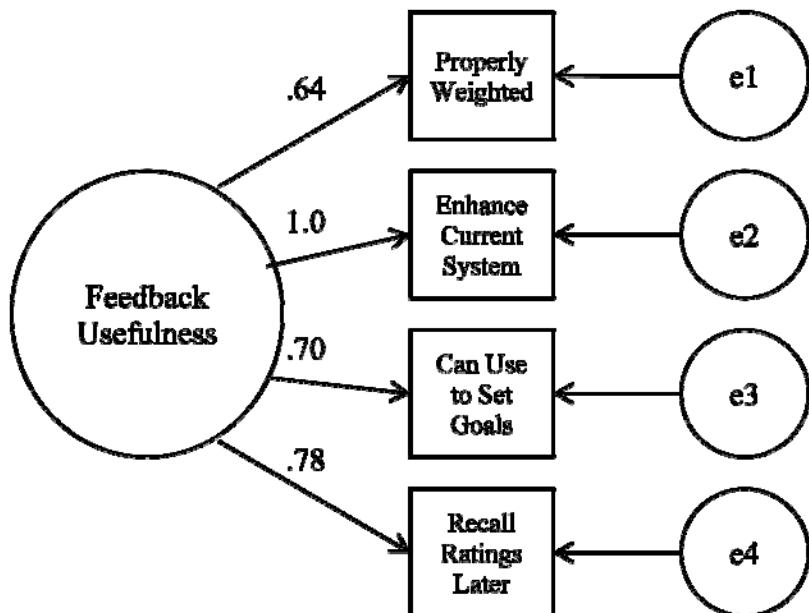


Figure 5. Feedback Usefulness Confirmatory Factor Analysis Model with Factor Loadings

IV. Analysis and Results

Correlations and Descriptives

Correlation analysis was accomplished on the moderator items. Table 1: Reliabilities, Means, and Correlation Data contains the means, standard deviations, correlations, and Cronbach's α for the items. Short titles correspond to complete items listed in Appendix C.

Table 1. Reliabilities, Means, and Correlation Data

Item	Mean	Std Dev	1	2	3	4	5	6	7	8
1. Easy to Interpret	3.36	1.03	.62							
2. Properly Weighted	2.84	1.15	.49*	.66						
3. Enhance Current System	3.27	1.03	.46*	.38*	.63					
4. Change Not Needed	2.59	0.99	.19*	.19*	-.09	.74				
5. Others' Inflated Ratings	2.71	0.76	-.03	.07	.05	.10	.73			
6. Accurate Ratings Important	4.24	0.75	.17*	.02	.32*	-.17*	-.01	.70		
7. Can Use to Set Goals	3.68	0.89	.49*	.30*	.56*	.01	.02	.41*	.63	
8. Remain Aware of Ratings	3.52	0.87	.48*	.28*	.51*	.04	-.01	.35*	.59*	.64
1) n=364; * p<.05 (2-tailed)										
2) Cronbach's α listed on the diagonal										

Regression Analysis

Hierarchical regressions were performed to test the relationships between negative transformational and transactional feedback, feedback usefulness, and task performance in a leadership development environment. Predictive Analytics Software (PASW) was used to regress novel communication and cognitive tasks on transformational and transactional feedback categories, respectively. In the first step (Model 1), task performances were regressed on the negative feedback and feedback usefulness ratings, while the cross-product of feedback usefulness ratings and negative feedback were added in the second step (Model 2) (consistent with Cohen, Cohen, West & Aiken, 2003).

Hypothesis One

Hypothesis one proposed that negative transformational feedback's effect on novel communication task performance is contingent upon perceived feedback usefulness, such that the relationship is stronger when feedback usefulness is high and weaker when it is low. Significance of the interaction term indicates moderation (Aguinis & Stone-Romero, 1997). As shown in Table 2, the interaction was significant, $\beta = -1.418$, $t(58) = -2.578$, $p < .05$. Also, the results in Table 3 highlight a significant interaction, $\beta = -1.358$, $t(58) = -2.450$, $p < .05$. Therefore, **hypothesis one is supported** as indicated by moderating effects on the Job Briefing and Project X #1 tasks.

Table 2. Regression of Job Briefing on Negative Transformational Feedback and Feedback Usefulness

Variable	Model 1	Model 2
	Betas (s.e.)	Betas (s.e.)
NegTF	.172 (.097)	1.583** (.406)
FU	-.137 (.047)	-.435* (.06)
FU \times NegTF		-1.418* (.117)
R	.197	.378
R^2	.039	.143
F	1.134	3.048*
$R^2 \Delta$.104
$F \Delta$		6.647
* $p < .05$ ** $p < .01$		

Table 3. Regression of Project X #1 on Negative Transformational Feedback and Feedback Usefulness

Variable	Model 1	Model 2
	Betas (s.e.)	Betas (s.e.)
NegTF	.110 (.401)	1.460* (1.693)
FU	-.174 (.193)	-.459* (.250)
FU × NegTF		-1.358* (.486)
<i>R</i>	.186	.360
<i>R</i> ²	.035	.130
<i>F</i>	1.001	2.728
<i>R</i> ² Δ		.095
<i>F</i> Δ		6.001

*p< .05 **p< .01

The significant interactions were plotted to better understand the form of the interaction. Figure 6 shows that students who received highly discrepant negative transformational feedback and perceived it as useful, earned a higher grade on the Job Briefing than those perceiving the feedback as not useful. Similarly, Figure 7 shows that students who received highly discrepant negative transformational feedback and perceived it as useful, earned a higher grade on Project X #1 than those perceiving the feedback as not useful. . In both cases, for those students perceiving the feedback as useful, task performance improved as negative feedback values increased in magnitude.

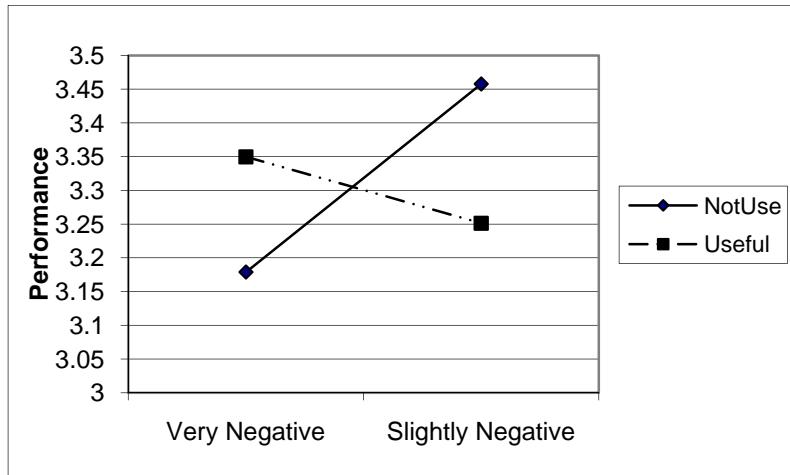


Figure 6. Moderation Plot of Job Briefing on Negative Transformational Feedback and Feedback Usefulness

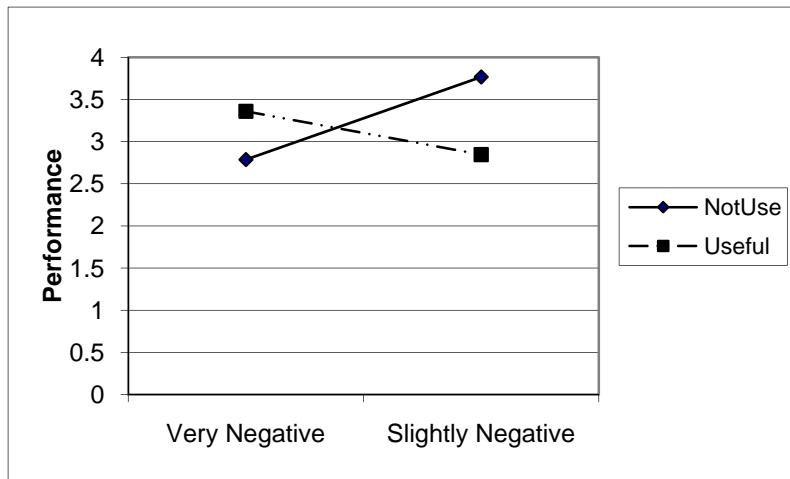


Figure 7. Moderation Plot of Project X #1 on Negative Transformational Feedback and Feedback Usefulness

Hypothesis Two

Hypothesis two proposed that negative transactional feedback's effect on novel cognitive task performance is contingent upon perceived feedback usefulness, such that the relationship is stronger when feedback usefulness is high and weaker when it is low. As with hypothesis one, the interaction term was examined for significance. As shown in

Table 4, the interaction was significant, $\beta = -.846$, $t(71) = -1.885$, $p < .10$. Also, the results in Table 5 highlight a significant interaction, $\beta = -.833$, $t(71) = -1.901$, $p < .10$. Therefore, **hypothesis two is supported** as indicated by moderating effects on the Performance Appraisal and Team Leadership Problem #2 tasks.

Table 4. Regression of Performance Appraisal Exercise on Negative Transactional Feedback and Feedback Usefulness

Variable	Model 1	Model 2
	Betas (s.e.)	Betas (s.e.)
NegTA	.038 (.131)	.842 (.479)
FU	.037 (.054)	-.232 (.083)
FU \times NegTA		-.846* (.141)
R	.056	.229
R^2	.003	.053
F	.109	1.259
$R^2 \Delta$.050
$F \Delta$		3.552
* $p < .10$ ** $p < .05$		

Table 5. Regression of Team Leadership Problem #2 on Negative Transactional Feedback and Feedback Usefulness

Variable	Model 1	Model 2
	Betas (s.e.)	Betas (s.e.)
NegTA	.160 (.400)	.951** (1.464)
FU	-.175 (.166)	-.440** (.254)
FU × NegTA		-.833* (.431)
<i>R</i>	.223	.312
<i>R</i> ²	.050	.98
<i>F</i>	1.803	2.452
<i>R</i> ² Δ		.048
<i>F</i> Δ		3.613
*p<.10 **p<.05		

As with hypothesis one, the significant interactions were plotted to better understand the form of the interaction. Figure 8 shows that students who received highly discrepant negative transactional feedback and perceived it as useful, earned a higher grade on the Performance Appraisal Exercise than those perceiving the feedback as not useful. Similarly, Figure 9 shows that students who received highly discrepant negative transactional feedback and perceived it as useful, earned a higher grade on Team Leadership Problem #2 than those perceiving the feedback as not useful. In both cases, for those students perceiving the feedback as useful, task performance improved as negative feedback values increased in magnitude.

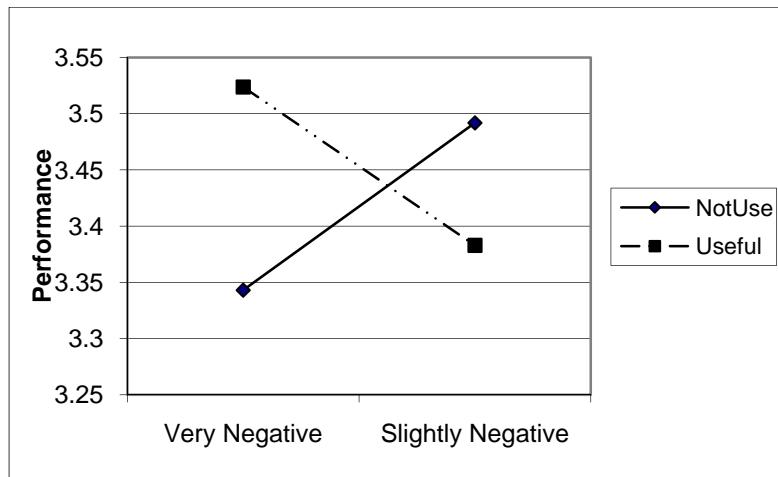


Figure 8. Moderation Plot of Performance Appraisal Exercise on Negative Transactional Feedback and Feedback Usefulness

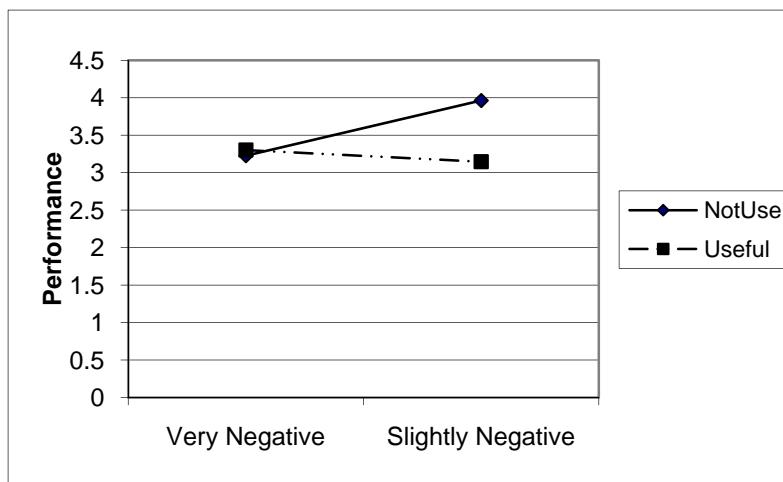


Figure 9. Moderation Plot of Team Leadership Problem #2 on Negative Transactional Feedback and Feedback Usefulness

V. Discussion and Conclusions

Discussion

Scholars have recommended additional research to determine the effects of negative feedback on performance, in order to augment an inconclusive body of knowledge. Moreover, motivational theorists are divided over which mechanisms drive human performance. Accordingly, this effort aligned with control theory and was designed to examine the impact of negative 360-degree feedback on objective measures of performance in a leadership development environment, while considering feedback usefulness.

Regression analysis demonstrated positive effects of negative feedback on performance, with moderating effects of feedback usefulness on four post-feedback tasks. These findings supported both hypotheses, suggesting that negative transformational and transactional feedback can influence performance on novel communication and cognitive tasks, respectively. Hence, in accordance with control theory, the absence of a reference standard (goal) for these tasks might suggest that students compared negative transformational and transactional feedback with hierarchical goals to generate a positive impact on task performance (for those students perceiving the feedback as useful). Therefore, academics and practitioners should reconsider their use of negative feedback when recipients are likely to perceive it as useful.

A feedback usefulness measure was also presented and its psychometric properties tested. Through exploratory and confirmatory factor analyses, the measure of feedback usefulness appeared to be effective. Goodness-of-fit statistics were found to

meet the requirements established in the literature for good model fit, and scale reliability was deemed acceptable by meeting standards for a new measure.

Implications

This research has implications for the application of 360-degree feedback in leadership development environments. Because negative transformational and transactional feedback appears to impact performance on novel communication and cognitive tasks, perhaps deliberately focused transformational and transactional feedback may improve student performance on select tasks. For example, negative transformational feedback can be delivered to students immediately prior to communication tasks in order to enhance performance.

Motivational theorists must not ignore the implications of negative feedback's effect on novel task performance, when recipients perceive feedback as useful. This thesis suggests that control theory's hierarchical arrangement of negative feedback loops are an effective mechanism for motivating human performance on novel tasks. In addition, the results contrast with goal-setting theorists' belief that task performance motivation is contingent upon the existence of specific goals.

The new measure of feedback usefulness provides academia with a tool adequate for use in feedback research. Additionally, organizations could adapt the items to suit 360-degree feedback initiatives in either their leadership development or human resource programs. Ultimately, the instrument could help gauge employee acceptance of the 360-degree feedback concept.

Limitations

Sample characteristics may be a limitation of this study. Oftentimes, using a military sample can compromise the ability to generalize results to the private sector. However, the representation of a wide variety of career fields and job specialties minimized this concern.

Another limitation may be the exclusive collection of self-report 360-degree survey data. It is possible that students deliberately or unintentionally misrepresented their actual behaviors for several reasons, including belief that the results would influence their permanent records. Although explicit directions outlined that surveys were for developmental purposes only, there were no items to test the truthfulness of individuals' responses.

It is possible that items derived from existing literature may not adequately reflect the entire content domain of feedback usefulness. Good model fit and strong reliability are desirable, but insufficient to verify the content validity of the measure. Perhaps the chosen items capture only a segment of this domain.

Although performance ratings are as objective as possible, they also are not without question. Evaluators are well trained, but personal biases and perceptual differences are still possible. There have been no attempts to establish the reliability or validity of the performance measures.

Future Research

This research provides a foundation for longitudinal studies focused on negative feedback's effect on task performance. Upon implementation of a robust 360-degree feedback framework, an organization could administer the program over the course of a subject's career. This strategy may help determine effects of time on the efficacy of negative feedback. Furthermore, such a design could allow researchers to observe a chronology of feedback antecedents.

Follow-on research might also consider investigating why this study demonstrated effects of negative transformational feedback on Project X #1 performance, but not Project X #2. Additionally, negative transactional feedback had an effect on Team Leadership Problem #2 performance, but not the first or third Team Leadership Problem. In both cases, it is unclear why the effects did not materialize on all measurements.

Appendix A: Sample 360-degree Feedback Report

		Transformational					Transactional				
		Contingent Reward (CR)	Management by Exception (MBE)	Laissez-Faire (LF)	CR	MBR	LF				
Idealized Influence (II)	Self	2.00	2.00	100.00	3.79	25.00		Self	2.00	2.00	100.00
	Supervisor	1.00	1.00	100.00	3.50	66.67		Supervisor	1.00	1.00	100.00
	Peer 1	4.00	4.50	50.00	4.50	50.00		Peer 1	4.00	4.50	50.00
	Peer 2	5.00	4.50	100.00	4.50	100.00		Peer 2	5.00	4.50	100.00
	Peer Mean	4.50	3.50		4.92			Peer Mean	4.50	3.50	4.92
	Sub 1	3.00	4.00	50.00	4.00	50.00		Sub 1	3.00	4.00	50.00
	Sub 2	5.00	4.00	100.00	4.00	100.00		Sub 2	5.00	4.00	100.00
	Sub Mean	4.00	5.00		4.79			Sub Mean	4.00	5.00	4.79
Inspirational Motivation (IM)	Self	2.00	2.00	100.00	3.79	25.00		Self	2.00	2.00	100.00
	Supervisor	1.00	1.00	100.00	3.50	66.67		Supervisor	1.00	1.00	100.00
	Peer 1	4.00	4.50	50.00	4.50	50.00		Peer 1	4.00	4.50	50.00
	Peer 2	5.00	4.50	100.00	4.50	100.00		Peer 2	5.00	4.50	100.00
	Peer Mean	4.50	3.50		4.92			Peer Mean	4.50	3.50	4.92
	Sub 1	3.00	4.00	50.00	4.00	50.00		Sub 1	3.00	4.00	50.00
	Sub 2	5.00	4.00	100.00	4.00	100.00		Sub 2	5.00	4.00	100.00
	Sub Mean	4.00	5.00		4.79			Sub Mean	4.00	5.00	4.79
Intellectual Stimulation (IS)	Self	2.00	2.00	100.00	3.79	25.00		Self	1.50	2.00	100.00
	Supervisor	1.00	1.00	100.00	3.50	66.67		Supervisor	1.00	1.00	100.00
	Peer 1	4.00	4.50	50.00	4.50	50.00		Peer 1	4.00	4.50	50.00
	Peer 2	5.00	4.50	100.00	4.50	100.00		Peer 2	5.00	4.50	100.00
	Peer Mean	4.50	3.50		4.92			Peer Mean	4.50	3.50	4.88
	Sub 1	3.00	4.00	50.00	4.00	50.00		Sub 1	3.00	4.00	50.00
	Sub 2	5.00	4.00	100.00	4.00	100.00		Sub 2	5.00	4.00	100.00
	Sub Mean	4.00	5.00		4.79			Sub Mean	4.00	5.00	4.75
Individual Consideration (IC)	Self	2.00	2.00	100.00	3.79	25.00		Self	2.00	2.00	1.50
	Supervisor	1.00	1.00	100.00	3.50	66.67		Supervisor-Self	-1.00	-1.00	-0.50
	Peer 1	4.00	4.50	50.00	4.50	50.00		Peer-Self	2.50	2.50	3.00
	Peer 2	5.00	4.50	100.00	4.50	100.00		Subordinate-Self	2.00	2.00	2.5
	Peer Mean	4.50	3.50		4.92						
	Sub 1	3.00	4.00	50.00	4.00	50.00					
	Sub 2	5.00	4.00	100.00	4.00	100.00					
	Sub Mean	4.00	5.00		4.79						
	II	IM	IS	IC							
Self	2.00	2.00	2.00	2.00							
Supervisor-Self	-1.00	-1.00	-1.00	-1.00							
Peer-Self	2.50	2.50	2.50	2.50							
Subordinate-Self	2.00	2.00	2.00	2.00							

Appendix B: Leadership Profile Measure 360-degree Survey Items

Transformational Feedback

Idealized Influence

- “I provide a good model for my team to follow.”
- “I lead by example.”
- “I have a clear understanding of where the team is going.”
- “I instill pride and respect in others.”

Inspirational Motivation

- “I say positive things about the team.”
- “I foster trust among team members.”
- “I foster involvement and cooperation among team members.”
- “I say things that make my teammates proud to be part of the team.”

Intellectual Stimulation

- “I ask questions that prompt others to think.”
- “I challenge others to think about old problems in new ways.”
- “I have stimulated others to rethink the way they do things.”
- “I have ideas that have challenged others to reexamine basic assumptions about their work.”

Individual Consideration

- “I support and encourage others' development.”
- “I give encouragement.”
- “I show respect for the personal feelings of others.”
- “I behave in a manner thoughtful of the personal needs of others.”

Transactional Feedback

Contingent Reward

- “I personally compliment others when they do outstanding work.”
- “I recognize others' accomplishments.”
- “I give others positive feedback when they perform well.”
- “I give others special recognition when their work is very good.”

Management-by-Exception

- “I focus others on problems when they don't meet standards.”
- “I stay informed of mistakes, complaints, and failures.”
- “I draw attention to missed opportunities.”

Appendix C: Feedback Usefulness Course Exit Survey Items

“My 360-degree feedback summary was easy to interpret.”

“My 360-degree feedback was properly weighted with one supervisor eval, two subordinate evals, and two peer evals.”

“360-degree feedback could enhance the USAF’s performance feedback system.”

“The current USAF feedback system does not need to be changed.”

“On this 360-degree feedback, I feel like others’ inflated their ratings of me.”

“Accurate feedback ratings are important to my leadership development.”

“I can use 360-degree feedback to set goals for improving my leadership ability.”

“One month after receiving 360-degree feedback, I remain aware of the ratings.”

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14. ABSTRACT While feedback is an essential element of performance, there is little theory explaining the effects of negative feedback. Disagreement exists as to whether negative feedback is good or bad and this impacts its use. Fortunately, control theory provides scholars with an opportunity to better understand negative feedback and the conditions necessary to support its intended function. This study examined the relationship between negative feedback and task performance in a leadership development environment. This work asserts that performance is contingent on perceived feedback usefulness, such that the relationship is stronger when feedback usefulness is high and weaker when it is low. In addition, this research led to the creation of a new instrument to measure perceptions of feedback usefulness as an antecedent of effective feedback. Results indicate positive effects of negative feedback on performance, with moderating effects of feedback usefulness on four post-feedback tasks. Analysis also demonstrated that the newly developed feedback usefulness scale demonstrates good model fit (evaluated by confirmatory factor analysis) and strong internal consistency reliability (Cronbach's α).				
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